

LIST OF CLAIMS / AMENDMENTS

Please amend claims 1-6, 8-9, and 11-32 as shown herein.

Claims 1-32 are pending and are listed following:

1. **(currently amended)** A method, comprising:
 - receiving an input;
 - ~~determining if the input can be processed by an optimized filter engine and,~~
 - ~~if so, directing the input to the optimized filter engine for processing;~~
 - ~~if the input cannot be processed by the optimized filter engine, directing the~~
 - ~~input to a generalized filter engine for processing;~~
 - determining whether the input can be processed by a selective sub-engine
 - which supports only a subset of a query language; and
 - if the determining indicates that the input can be processed by the
 - selective sub-engine, then directing the input to the selective sub-engine
 - for processing in less time than would be required by a general sub-
 - engine which fully supports the query language;
 - if the determining indicates that the input cannot be processed by
 - the selective sub-engine, then directing the input to the general sub-
 - engine for processing; and
 - processing the input to derive a result;
 - ~~wherein the generalized filter engine is configured to handle terms of a~~
 - ~~language to which the input conforms and the optimized filter engine is configured~~
 - ~~to process a subset of the terms of the language.~~

1 **2. (currently amended)** The method as recited in claim 1,
2 wherein:

3 ~~the optimized filter engine further comprises an optimized filter sub-engine;~~
4 ~~the generalized filter engine further comprises a generalized filter sub-~~
5 engine; and

6 ~~the optimized filter sub-engine~~ selective sub-engine and the ~~generalized~~
7 filter general sub-engine are encompassed by a single filter engine.

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9 **3. (currently amended)** The method as recited in claim 1,
10 wherein the determining step further comprises recognizing whether or not the
11 input conforms to a grammar of the ~~optimized filter engine~~ selective sub-engine.

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13 **4. (currently amended)** The method as recited in claim 1,
14 wherein the input language ~~further~~ comprises a query language based on
15 eXtensible Markup Language (XML).

1 **5. (currently amended)** The method as recited in claim 1,
2 wherein the ~~optimized filter engine is a first optimized filter engine and~~ selective
3 sub-engine includes a first sub-engine which supports only a first unique subset of
4 the query language and a second sub-engine which supports only a second unique
5 subset of the query language, and wherein the method further comprises:

6 ~~if the input cannot be processed by the first optimized filter engine,~~
7 ~~determining if the input can be processed by a second optimized filter engine;~~

8 ~~directing the input to the second optimized filter engine if the second~~
9 ~~optimized filter engine can process the input;~~

10 ~~directing the input to the generalized filter engine for processing if the~~
11 ~~second optimized filter engine cannot process the input; and~~

12 ~~wherein the second optimized filter engine is configured to handle a subset~~
13 ~~of the input language, the subset of the second optimized filter engine is different~~
14 ~~than the subset of the first optimized filter engine.~~

15 determining whether the input can be processed by the first sub-engine or
16 by the second sub-engine;

17 if the determining indicates that the input can be processed by the
18 first sub-engine, then directing the input to the first sub-engine for
19 processing;

20 if the determining indicates that the input can be processed by the
21 second sub-engine, then directing the input to the second sub-engine for
22 processing; and

1 if the determining indicates that the input cannot be processed by
2 the first sub-engine, and that the input cannot be processed by the
3 second sub-engine, then directing the input to the general sub-engine for
4 processing.

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6 **6. (currently amended)** The method as recited in claim 1, further
7 comprising:

8 parsing the input to determine if ~~multiple discrete~~ different sub-expressions
9 can be identified;

10 if the different sub-expressions are identified, determining if a first sub-
11 expression can be processed by the ~~optimized filter engine~~ selective sub-engine;

12 if the first sub-expression can be processed by the ~~optimized filter engine~~
13 selective sub-engine, then directing the first sub-expression to the ~~optimized filter~~
14 ~~engine~~ selective sub-engine for processing;

15 if the first sub-expression cannot be processed by the ~~optimized filter~~
16 ~~engine~~ selective sub-engine, directing the first sub-expression to the ~~optimized~~
17 ~~filter engine~~ general sub-engine for processing;

18 if a second sub-expression can be processed by the ~~optimized filter engine~~
19 selective sub-engine, directing the second sub-expression to the ~~optimized filter~~
20 ~~engine~~ selective sub-engine for processing; and

21 if the second sub-expression cannot be processed by the ~~optimized filter~~
22 ~~engine~~ selective sub-engine, directing the second sub-expression to the ~~optimized~~
23 ~~filter engine~~ general sub-engine for processing.

1 7. **(original)** The method as recited in claim 6, further comprising:
2 obtaining a result of the processing of the first sub-expression; and
3 processing the second sub-expression only if the result of the first sub-
4 expression is true.

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6 8. **(currently amended)** A filter engine, comprising:
7 at least one ~~optimized matcher~~ selective sub-engine configured to accept an
8 input and process the input against a filter table associated with the ~~optimized~~
9 ~~matcher~~ selective sub-engine, wherein the selective sub-engine is configured to
10 process only a subset of terms of an input language;

11 a ~~generalized matcher~~ general sub-engine configured to accept an input and
12 process the input against a filter table associated with the ~~generalized matcher~~
13 general sub-engine, wherein the general sub-engine is configured to process only
14 all terms of the input language; and

15 an analyzer configured to determine whether the input can be processed by
16 the ~~optimized matcher~~ selective sub-engine and, if so, directing the input to the
17 ~~optimized matcher~~ selective sub-engine for processing or, if not, directing the
18 input to the ~~generalized matcher~~ general sub-engine for processing; and

19 wherein:

20 the ~~generalized matcher~~ is configured to process all terms of an input
21 language; and

22 the ~~optimized matcher~~ is configured to process only a subset of the terms of
23 the input language.

1 **9. (currently amended)** The filter engine as recited in claim 8,
2 wherein the analyzer is further configured to analyze a new filter added to the filter
3 engine and to determine an appropriate matcher with which to ~~associated~~ associate
4 the new filter.

5
6 **10. (original)** The filter engine as recited in claim 8, wherein the
7 input language is XPath.

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9 **11. (currently amended)** The filter engine as recited in claim 8,
10 wherein the analyzer is further configured to determine whether the ~~optimized~~
11 ~~matcher~~ selective sub-engine can process the input by comparing the input to a
12 grammar associated with the ~~optimized-matcher~~ selective sub-engine and
13 determining whether the input consists of terms that are compatible with the
14 grammar.

1 **12. (currently amended)** The filter engine as recited in claim 8,
2 further comprising a sub-expression module that is configured to:

3 determine whether ~~an input~~ the input consists of ~~distinct~~ different sub-
4 expressions;

5 if the input consists of ~~distinct~~ different sub-expressions, directing each
6 ~~sub-expression~~ of the different sub-expressions contained in the input to the
7 analyzer; and

8 wherein the analyzer is further configured to determine whether a ~~sub-~~
9 ~~expression~~ each of the different sub-expressions can be processed by the ~~optimized~~
10 efficient matcher and to direct each ~~sub-expression~~ of the different sub-expressions
11 to an appropriate matcher for processing.

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13 **13. (currently amended)** The filter engine as recited in claim 12,
14 wherein a first sub-expression may be directed to the ~~optimized matcher~~ selective
15 sub-engine and a second sub-expression may be directed to the ~~generalized~~
16 ~~matcher~~ general sub-engine.

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18 **14. (currently amended)** The filter engine as recited in claim 8,
19 wherein the at least one ~~optimized matcher~~ selective sub-engine further comprises:

20 a first ~~optimized matcher~~ selective sub-engine configured to process inputs
21 that conform to a first subset of the input language;

22 a second ~~optimized matcher~~ selective sub-engine configured to process
23 inputs that conform to a second subset of the input language; and

24 wherein the first subset and the second subset are unique subsets of the
25 input language.

1
2 **15. (currently amended)** One or more computer-readable storage
3 media containing computer-executable instructions that, when executed on a
4 computer, perform the following steps:

5 determining an appropriate ~~matcher~~ sub-engine to which an input message
6 should be directed for processing against a set of queries;

7 processing the input message in a ~~first filter engine~~ selective sub-engine if
8 the ~~first filter engine~~ selective sub-engine comprises a grammar that supports
9 processing of the input message;

10 processing the input message in a ~~second filter engine~~ general sub-engine if
11 the ~~first filter engine~~ selective sub-engine grammar does not support processing of
12 the input message; and

13 wherein:

14 the input message is in accordance with a query language;

15 the ~~first filter engine~~ selective sub-engine supports a subset of the query
16 language; and

17 the ~~second filter engine~~ general sub-engine supports the entire query
18 language.

19
20 **16. (currently amended)** The one or more computer-readable
21 storage media as recited in claim 15, further comprising the step of accepting input
22 messages for both ~~filter engines~~ the selective sub-engine and the general sub-
23 engine by way of a single input means so that an input message sending
24 application does not have to distinguish between the ~~first filter engine~~ and the
25 ~~second filter engine~~ the selective sub-engine and the general sub-engine.

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2 **17. (currently amended)** The one or more computer-readable
3 storage media as recited in claim 15, wherein the query language is XPath.

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5 **18. (currently amended)** The one or more computer-readable
6 storage media as recited in claim 15, wherein the query language is an XML query
7 language.

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9 **19. (currently amended)** The one or more computer-readable
10 storage media as recited in claim 15, further comprising the steps of:

11 analyzing the input message prior to determining which ~~filter engine~~ sub-
12 engine will process the input message, and to determine if the input message can
13 be parsed into two or more sub-expressions;

14 for each sub-expression identified, determining an appropriate ~~matcher~~ sub-
15 engine that can process the sub-expression; and

16 directing each sub-expression to the appropriate ~~matcher~~ sub-engine for
17 processing.

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19 **20. (currently amended)** The one or more computer-readable
20 storage media as recited in claim 19, further comprising the step of deriving a final
21 result of the input message processing from at least one result of the sub-
22 expression processing.

1 **21. (currently amended)** The one or more computer-readable
2 storage media as recited in claim 19, further comprising the steps of:

3 determining if a first sub-expression evaluates true;
4 proceeding with processing of subsequent sub-expressions if the first sub-
5 expression is true; and
6 foregoing processing of subsequent sub-expressions if the first sub-
7 expression is false.

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9 **22. (currently amended)** The one or more computer-readable
10 storage media as recited in claim 15, wherein each ~~matcher~~ sub-engine includes a
11 set of queries against which input messages directed to the respective ~~matchers~~
12 sub-engine are tried, and wherein each set of queries is unique.

1 **23. (currently amended)** A message processing system,
2 comprising:

3 means for receiving a message;

4 ~~an optimized filter processor~~ a selective sub-engine which supports only a
5 subset of a message language;

6 ~~a general filter processor~~ a general sub-engine which supports all of the
7 message language;

8 analyzing means for analyzing the message to determine if the ~~optimized~~
9 ~~filter processor~~ selective sub-engine is configured to process the message;

10 distribution means for distributing the message to the ~~optimized filter~~
11 ~~processor~~ selective sub-engine if the ~~optimized filter processor~~ selective sub-
12 engine can process the message or to the ~~general filter processor~~ general sub-
13 engine if the ~~optimized filter processor~~ selective sub-engine cannot process the
14 message.

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16 **24. (currently amended)** The message processing system as
17 recited in claim 23, wherein:

18 the ~~optimized filter processor~~ selective sub-engine further comprises a first
19 set of queries against which a message directed to the ~~optimized filter processor~~ is
20 ~~compared~~ the message can be compared;

21 the ~~general filter processor~~ general sub-engine further comprises a second
22 set of queries against which a message directed to the ~~general filter processor~~ is
23 ~~compared~~ the message can be compared; and

24 the first set of queries contains fewer queries than the second set of queries.
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1 **25. (currently amended)** The message processing system as
2 recited in claim 23, wherein:

3 the message conforms to an XML query language;

4 the ~~general filter processor~~ general sub-engine is configured to support the
5 entire XML query language; and

6 the ~~optimized filter processor~~ selective sub-engine is configured to support
7 a subset of the XML query language.

8
9 **26. (currently amended)** The message processing system as
10 recited in claim 25, wherein the XML query language is XPath.

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12 **27. (currently amended)** The message processing system as
13 recited in claim 23, wherein the ~~optimized filter processor~~ selective sub-engine
14 further comprises means for ~~optimizing~~ increasing message processing ~~over the set~~
15 ~~of queries included in the optimized filter processor~~ performance includes
16 combining individual filters for use in a single procedure.

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18 **28. (currently amended)** The message processing system as
19 recited in claim 27, wherein the means for ~~optimizing~~ increasing message
20 processing performance further comprises a hash function.

1 **29. (currently amended)** The message processing system as
2 recited in claim 23, wherein: ~~the optimized filter processor is a first filter processor~~
3 the selective sub-engine includes a first selective sub-engine which supports only a
4 first unique subset of the query language and a second selective sub-engine which
5 supports only a second unique subset of the query language;

6 ~~the message processing system further comprises a second optimized filter~~
7 ~~processor to which messages may be directed, the second optimized filter~~
8 ~~processor supporting a unique subset of the query language; and~~

9 the distribution means is further configured to direct the message to the
10 ~~second optimized filter processor~~ second selective sub-engine if the ~~first optimized~~
11 ~~filter processor~~ first selective sub-engine cannot process the message but the
12 ~~second optimized filter processor~~ second selective sub-engine can process the
13 message.

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15 **30. (currently amended)** The message processing system as
16 recited in claim 23, further comprising means for parsing the message into
17 constituent sub-expressions, and wherein the analyzing means is further configured
18 to process individual sub-expression as an individual message and to evaluate sub-
19 expression processing results to derive a result corresponding to the message.

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21 **31. (currently amended)** The message processing system as
22 recited in claim 23, wherein the message is a sub-expression of a parent message.
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1 **32. (currently amended)** The message processing system as
2 recited in claim 23, further comprising means for determining whether a filter in
3 the system is associated with ~~the generalized filter processor or the optimized filter~~
4 ~~processor~~ the general sub-engine or with the selective sub-engine.
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